

SEQUENCE LISTING

<110> Cox III, George N
Bolder Biotechnology, Inc.

<120> Derivatives of Growth Hormone and Related Proteins, and Methods of Use
Thereof

<130> 4152-1-PUS-8

<150> 60/418,106
<151> 2002-10-11

<150> 60/418,105
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<150> 10/400,377
<151> 2003-03-26

<150> 09/462,941
<151> 2000-01-14

<150> PCT/US98/14497
<151> 1998-07-13

<150> 60/052,516
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<150> 10/298,148
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<150> 60/332,285
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<150> 60/116,041
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<150> PCT/US01/16088
<151> 2001-05-16

<150> 60/204,617
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<170> PatentIn Ver. 2.0

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<212> PRT

<213> Homo sapiens

<400> 1

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| Phe | Pro | Thr | Ile | Pro | Leu | Ser | Arg | Leu | Phe | Asp | Asn | Ala | Met | Leu | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ala | His | Arg | Leu | His | Gln | Leu | Ala | Phe | Asp | Thr | Tyr | Gln | Glu | Phe | Glu |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Glu | Ala | Tyr | Ile | Pro | Lys | Glu | Gln | Lys | Tyr | Ser | Phe | Leu | Gln | Asn | Pro |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Thr | Ser | Leu | Cys | Phe | Ser | Glu | Ser | Ile | Pro | Thr | Pro | Ser | Asn | Arg |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Glu | Glu | Thr | Gln | Gln | Lys | Ser | Asn | Leu | Glu | Leu | Leu | Arg | Ile | Ser | Leu |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| Leu | Leu | Ile | Gln | Ser | Trp | Leu | Glu | Pro | Val | Gln | Phe | Leu | Arg | Ser | Val |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Phe | Ala | Asn | Ser | Leu | Val | Tyr | Gly | Ala | Ser | Asp | Ser | Asn | Val | Tyr | Asp |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Leu | Leu | Lys | Asp | Leu | Glu | Glu | Gly | Ile | Gln | Thr | Leu | Met | Gly | Arg | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Glu | Asp | Gly | Ser | Pro | Arg | Thr | Gly | Gln | Ile | Phe | Lys | Gln | Thr | Tyr | Ser |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Lys | Phe | Asp | Thr | Asn | Ser | His | Asn | Asp | Asp | Ala | Leu | Leu | Lys | Asn | Tyr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gly | Leu | Leu | Tyr | Cys | Phe | Arg | Lys | Asp | Met | Asp | Lys | Val | Glu | Thr | Phe |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Leu | Arg | Ile | Val | Gln | Cys | Arg | Ser | Val | Glu | Gly | Ser | Cys | Gly | Phe | |
| | | | 180 | | | | | 185 | | | | | 190 | | |

<210> 2

<211> 166

<212> PRT

<213> Homo sapiens

<400> 2

Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
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 Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
 20 25 30
 Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
 35 40 45
 Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
 50 55 60
 Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
 65 70 75 80
 Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
 85 90 95
 Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
 100 105 110
 Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
 115 120 125
 Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
 130 135 140
 Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
 145 150 155 160
 Cys Arg Thr Gly Asp Arg
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<210> 3
 <211> 165
 <212> PRT
 <213> Homo sapiens

<400> 3

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Ser Arg Arg Thr Leu Met
 1 5 10 15
 Leu Leu Ala Gln Met Arg Arg Ile Ser Leu Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Gly Asn Gln Phe Gln
 35 40 45
 Lys Ala Glu Thr Ile Pro Val Leu His Glu Met Ile Gln Gln Ile Phe
 50 55 60
 Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Thr Leu
 65 70 75 80
 Leu Asp Lys Phe Tyr Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu Glu

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | 85 | | | | | | 90 | | | | | 95 | | |
| Ala | Cys | Val | Ile | Gln | Gly | Val | Gly | Val | Thr | Glu | Thr | Pro | Leu | Met | Lys | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Glu | Asp | Ser | Ile | Leu | Ala | Val | Arg | Lys | Tyr | Phe | Gln | Arg | Ile | Thr | Leu | | |
| | | 115 | | | | | 120 | | | | 125 | | | | | | |
| Tyr | Leu | Lys | Glu | Lys | Lys | Tyr | Ser | Pro | Cys | Ala | Trp | Glu | Val | Val | Arg | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Ala | Glu | Ile | Met | Arg | Ser | Phe | Ser | Leu | Ser | Thr | Asn | Leu | Gln | Glu | Ser | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Leu | Arg | Ser | Lys | Glu | | | | | | | | | | | | | |
| | | | | 165 | | | | | | | | | | | | | |

<210> 4
 <211> 166
 <212> PRT
 <213> Homo sapiens

<400> 4

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Asp | Leu | Pro | Glu | Thr | His | Ser | Leu | Asp | Asn | Arg | Arg | Thr | Leu | Met |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Leu | Leu | Ala | Gln | Met | Ser | Arg | Ile | Ser | Pro | Ser | Ser | Cys | Leu | Met | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Arg | His | Asp | Phe | Gly | Phe | Pro | Gln | Glu | Glu | Phe | Asp | Gly | Asn | Gln | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Lys | Ala | Pro | Ala | Ile | Ser | Val | Leu | His | Glu | Leu | Ile | Gln | Gln | Ile |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Phe | Asn | Leu | Phe | Thr | Thr | Lys | Asp | Ser | Ser | Ala | Ala | Trp | Asp | Glu | Asp |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |
| Leu | Leu | Asp | Lys | Phe | Cys | Thr | Glu | Leu | Tyr | Gln | Gln | Leu | Asn | Asp | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Glu | Ala | Cys | Val | Met | Gln | Glu | Glu | Arg | Val | Gly | Glu | Thr | Pro | Leu | Met |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Asn | Ala | Asp | Ser | Ile | Leu | Ala | Val | Lys | Lys | Tyr | Phe | Arg | Arg | Ile | Thr |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Tyr | Leu | Thr | Glu | Lys | Lys | Tyr | Ser | Pro | Cys | Ala | Trp | Glu | Val | Val |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Arg | Ala | Glu | Ile | Met | Arg | Ser | Leu | Ser | Leu | Ser | Thr | Asn | Leu | Gln | Glu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Arg | Leu | Arg | Arg | Lys | Glu | | | | | | | | | | |
| | | | | 165 | | | | | | | | | | | |

<210> 5
 <211> 166
 <212> PRT
 <213> Homo sapiens

<400> 5

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Tyr | Asn | Leu | Leu | Gly | Phe | Leu | Gln | Arg | Ser | Ser | Asn | Phe | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Cys | Gln | Lys | Leu | Leu | Trp | Gln | Leu | Asn | Gly | Arg | Leu | Glu | Tyr | Cys | Leu |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Lys | Asp | Arg | Met | Asn | Phe | Asp | Ile | Pro | Glu | Glu | Ile | Lys | Gln | Leu | Gln |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Phe | Gln | Lys | Glu | Asp | Ala | Ala | Leu | Thr | Ile | Tyr | Glu | Met | Leu | Gln |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Asn | Ile | Phe | Ala | Ile | Phe | Arg | Gln | Asp | Ser | Ser | Ser | Thr | Gly | Trp | Asn |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Glu | Thr | Ile | Val | Glu | Asn | Leu | Leu | Ala | Asn | Val | Tyr | His | Gln | Ile | Asn |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| His | Leu | Lys | Thr | Val | Leu | Glu | Glu | Lys | Leu | Glu | Lys | Glu | Asp | Phe | Thr |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Arg | Gly | Lys | Leu | Met | Ser | Ser | Leu | His | Leu | Lys | Arg | Tyr | Tyr | Gly | Arg |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ile | Leu | His | Tyr | Leu | Lys | Ala | Lys | Glu | Tyr | Ser | His | Cys | Ala | Trp | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ile | Val | Arg | Val | Glu | Ile | Leu | Arg | Asn | Phe | Tyr | Phe | Ile | Asn | Arg | Leu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Thr | Gly | Tyr | Leu | Arg | Asn | | | | | | | | | | |
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<400> 6

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Pro | Leu | Gly | Pro | Ala | Ser | Ser | Leu | Pro | Gln | Ser | Phe | Leu | Leu | Lys |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Cys | Leu | Glu | Gln | Val | Arg | Lys | Ile | Gln | Gly | Asp | Gly | Ala | Ala | Leu | Gln |
| | | | 20 | | | | | 25 | | | | | 30 | | |

Glu Lys Leu Cys Ala Thr Tyr Lys Leu Cys His Pro Glu Glu Leu Val
 35 40 45
 Leu Leu Gly His Ser Leu Gly Ile Pro Trp Ala Pro Leu Ser Ser Cys
 50 55 60
 Pro Ser Gln Ala Leu Gln Leu Ala Gly Cys Leu Ser Gln Leu His Ser
 65 70 75 80
 Gly Leu Phe Leu Tyr Gln Gly Leu Leu Gln Ala Leu Glu Gly Ile Ser
 85 90 95
 Pro Glu Leu Gly Pro Thr Leu Asp Thr Leu Gln Leu Asp Val Ala Asp
 100 105 110
 Phe Ala Thr Thr Ile Trp Gln Gln Met Glu Glu Leu Gly Met Ala Pro
 115 120 125
 Ala Leu Gln Pro Thr Gln Gly Ala Met Pro Ala Phe Ala Ser Ala Phe
 130 135 140
 Gln Arg Arg Ala Gly Gly Val Leu Val Ala Ser His Leu Gln Ser Phe
 145 150 155 160
 Leu Glu Val Ser Tyr Arg Val Leu Arg His Leu Ala Gln Pro
 165 170

<210> 7
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 <212> PRT
 <213> Homo sapiens

<400> 7
 Ser Pro Ala Pro Pro Ala Cys Asp Leu Arg Val Leu Ser Lys Leu Leu
 1 5 10 15
 Arg Asp Ser His Val Leu His Ser Arg Leu Ser Gln Cys Pro Glu Val
 20 25 30
 His Pro Leu Pro Thr Pro Val Leu Leu Pro Ala Val Asp Phe Ser Leu
 35 40 45
 Gly Glu Trp Lys Thr Gln Met Glu Glu Thr Lys Ala Gln Asp Ile Leu
 50 55 60
 Gly Ala Val Thr Leu Leu Leu Glu Gly Val Met Ala Ala Arg Gly Gln
 65 70 75 80
 Leu Gly Pro Thr Cys Leu Ser Ser Leu Leu Gly Gln Leu Ser Gly Gln
 85 90 95
 Val Arg Leu Leu Leu Gly Ala Leu Gln Ser Leu Leu Gly Thr Gln Leu
 100 105 110

Pro Pro Gln Gly Arg Thr Thr Ala His Lys Asp Pro Asn Ala Ile Phe
 115 120 125
 Leu Ser Phe Gln His Leu Leu Arg Gly Lys Val Arg Phe Leu Met Leu
 130 135 140
 Val Gly Gly Ser Thr Leu Cys Val Arg Arg Ala Pro Pro Thr Thr Ala
 145 150 155 160
 Val Pro Ser Arg Thr Ser Leu Val Leu Thr Leu Asn Glu Leu Pro Asn
 165 170 175
 Arg Thr Ser Gly Leu Leu Glu Thr Asn Phe Thr Ala Ser Ala Arg Thr
 180 185 190
 Thr Gly Ser Gly Leu Leu Lys Trp Gln Gln Gly Phe Arg Ala Lys Ile
 195 200 205
 Pro Gly Leu Leu Asn Gln Thr Ser Arg Ser Leu Asp Gln Ile Pro Gly
 210 215 220
 Tyr Leu Asn Arg Ile His Glu Leu Leu Asn Gly Thr Arg Gly Leu Phe
 225 230 235 240
 Pro Gly Pro Ser Arg Arg Thr Leu Gly Ala Pro Asp Ile Ser Ser Gly
 245 250 255
 Thr Ser Asp Thr Gly Ser Leu Pro Pro Asn Leu Gln Pro Gly Tyr Ser
 260 265 270
 Pro Ser Pro Thr His Pro Pro Thr Gly Gly Tyr Thr Leu Phe Pro Leu
 275 280 285
 Pro Pro Thr Leu Pro Thr Pro Val Val Gln Leu His Pro Leu Leu Pro
 290 295 300
 Asp Pro Ser Ala Pro Thr Pro Thr Pro Thr Ser Pro Leu Leu Asn Thr
 305 310 315 320
 Ser Tyr Thr His Ser Gln Asn Leu Ser Gln Glu Gly
 325 330

<210> 8
 <211> 127
 <212> PRT
 <213> Homo sapiens

<400> 8

Ala Pro Ala Arg Ser Pro Ser Pro Ser Thr Gln Pro Trp Glu His Val
 1 5 10 15
 Asn Ala Ile Gln Glu Ala Arg Arg Leu Leu Asn Leu Ser Arg Asp Thr
 20 25 30
 Ala Ala Glu Met Asn Glu Thr Val Glu Val Ile Ser Glu Met Phe Asp

| | | |
|-----------------------------|-------------------------|-------------------------|
| 35 | 40 | 45 |
| Leu Gln Glu Pro Thr Cys | Leu Gln Thr Arg | Leu Glu Leu Tyr Lys Gln |
| 50 | 55 | 60 |
| Gly Leu Arg Gly Ser | Leu Thr Lys Leu Lys Gly | Pro Leu Thr Met Met |
| 65 | 70 | 75 |
| Ala Ser His Tyr Lys | Gln His Cys Pro Pro Thr | Pro Glu Thr Ser Cys |
| 85 | 90 | 95 |
| Ala Thr Gln Ile Ile Thr Phe | Glu Ser Phe Lys Glu Asn | Leu Lys Asp |
| 100 | 105 | 110 |
| Phe Leu Leu Val Ile Pro Phe | Asp Cys Trp Glu Pro Val | Gln Glu |
| 115 | 120 | 125 |

<210> 9
 <211> 133
 <212> PRT
 <213> Homo sapiens

<400> 9

| |
|---|
| Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His |
| 1 5 10 15 |
| Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys |
| 20 25 30 |
| Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro Lys |
| 35 40 45 |
| Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys |
| 50 55 60 |
| Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu |
| 65 70 75 80 |
| Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu |
| 85 90 95 |
| Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala |
| 100 105 110 |
| Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile |
| 115 120 125 |
| Ile Ser Thr Leu Thr |
| 130 |

<210> 10
 <211> 152
 <212> PRT

<213> Homo sapiens

<400> 10

Met Ser Arg Leu Pro Val Leu Leu Leu Leu Gln Leu Leu Val Arg Pro
1 5 10 15
Gly Leu Gln Ala Pro Met Thr Gln Thr Thr Pro Leu Lys Thr Ser Trp
20 25 30
Val Asn Cys Ser Asn Met Ile Asp Glu Ile Ile Thr His Leu Lys Gln
35 40 45
Pro Pro Leu Pro Leu Leu Asp Phe Asn Asn Leu Asn Gly Glu Asp Gln
50 55 60
Asp Ile Leu Met Glu Asn Asn Leu Arg Arg Pro Asn Leu Glu Ala Phe
65 70 75 80
Asn Arg Ala Val Lys Ser Leu Gln Asn Ala Ser Ala Ile Glu Ser Ile
85 90 95
Leu Lys Asn Leu Leu Pro Cys Leu Pro Leu Ala Thr Ala Ala Pro Thr
100 105 110
Arg His Pro Ile His Ile Lys Asp Gly Asp Trp Asn Glu Phe Arg Arg
115 120 125
Lys Leu Thr Phe Tyr Leu Lys Thr Leu Glu Asn Ala Gln Ala Gln Gln
130 135 140
Thr Thr Leu Ser Leu Ala Ile Phe
145 150

<210> 11

<211> 129

<212> PRT

<213> Homo sapiens

<400> 11

His Lys Cys Asp Ile Thr Leu Gln Glu Ile Ile Lys Thr Leu Asn Ser
1 5 10 15
Leu Thr Glu Gln Lys Thr Leu Cys Thr Glu Leu Thr Val Thr Asp Ile
20 25 30
Phe Ala Ala Ser Lys Asn Thr Thr Glu Lys Glu Thr Phe Cys Arg Ala
35 40 45
Ala Thr Val Leu Arg Gln Phe Tyr Ser His His Glu Lys Asp Thr Arg
50 55 60

Cys Leu Gly Ala Thr Ala Gln Gln Phe His Arg His Lys Gln Leu Ile
 65 70 75 80
 Arg Phe Leu Lys Arg Leu Asp Arg Asn Leu Trp Gly Leu Ala Gly Leu
 85 90 95
 Asn Ser Cys Pro Val Lys Glu Ala Asn Gln Ser Thr Leu Glu Asn Phe
 100 105 110
 Leu Glu Arg Leu Lys Thr Ile Met Arg Glu Lys Tyr Ser Lys Cys Ser
 115 120 125
 Ser

<210> 12

<211> 134

<212> PRT

<213> Homo sapiens

<400> 12

Met Arg Met Leu Leu His Leu Ser Leu Leu Ala Leu Gly Ala Ala Tyr
 1 5 10 15
 Val Tyr Ala Ile Pro Thr Glu Ile Pro Thr Ser Ala Leu Val Lys Glu
 20 25 30
 Thr Leu Ala Leu Leu Ser Thr His Arg Thr Leu Leu Ile Ala Asn Glu
 35 40 45
 Thr Leu Arg Ile Pro Val Pro Val His Lys Asn His Gln Leu Cys Thr
 50 55 60
 Glu Glu Ile Phe Gln Gly Ile Gly Thr Leu Glu Ser Gln Thr Val Gln
 65 70 75 80
 Gly Gly Thr Val Glu Arg Leu Phe Lys Asn Leu Ser Leu Ile Lys Lys
 85 90 95
 Tyr Ile Asp Gly Gln Lys Lys Lys Cys Gly Glu Glu Arg Arg Arg Val
 100 105 110
 Asn Gln Phe Leu Asp Tyr Leu Gln Glu Phe Leu Gly Val Met Asn Thr
 115 120 125
 Glu Trp Ile Ile Glu Ser
 130

<210> 13

<211> 212

<212> PRT

<213> Homo sapiens

<400> 13

Met Asn Ser Phe Ser Thr Ser Ala Phe Gly Pro Val Ala Phe Ser Leu
1 5 10 15
Gly Leu Leu Leu Val Leu Pro Ala Ala Phe Pro Ala Pro Val Pro Pro
20 25 30
Gly Glu Asp Ser Lys Asp Val Ala Ala Pro His Arg Gln Pro Leu Thr
35 40 45
Ser Ser Glu Arg Ile Asp Lys Gln Ile Arg Tyr Ile Leu Asp Gly Ile
50 55 60
Ser Ala Leu Arg Lys Glu Thr Cys Asn Lys Ser Asn Met Cys Glu Ser
65 70 75 80
Ser Lys Glu Ala Leu Ala Glu Asn Asn Leu Asn Leu Pro Lys Met Ala
85 90 95
Glu Lys Asp Gly Cys Phe Gln Ser Gly Phe Asn Glu Glu Thr Cys Leu
100 105 110
Val Lys Ile Ile Thr Gly Leu Leu Glu Phe Glu Val Tyr Leu Glu Tyr
115 120 125
Leu Gln Asn Arg Phe Glu Ser Ser Glu Glu Gln Ala Arg Ala Val Gln
130 135 140
Met Ser Thr Lys Val Leu Ile Gln Phe Leu Gln Lys Lys Ala Lys Asn
145 150 155 160
Leu Asp Ala Ile Thr Thr Pro Asp Pro Thr Thr Asn Ala Ser Leu Leu
165 170 175
Thr Lys Leu Gln Ala Gln Asn Gln Trp Leu Gln Asp Met Thr Thr His
180 185 190
Leu Ile Leu Arg Ser Phe Lys Glu Phe Leu Gln Ser Ser Leu Arg Ala
195 200 205
Leu Arg Gln Met
210

<210> 14

<211> 177

<212> PRT

<213> Homo sapiens

<400> 14

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | | 5 | | 10 | | 15 | | | | | | | | | |
| Leu | Val | Leu | Leu | Pro | Val | Ala | Ser | Ser | Asp | Cys | Asp | Ile | Glu | Gly | Lys |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Asp | Gly | Lys | Gln | Tyr | Glu | Ser | Val | Leu | Met | Val | Ser | Ile | Asp | Gln | Leu |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Asp | Ser | Met | Lys | Glu | Ile | Gly | Ser | Asn | Cys | Leu | Asn | Asn | Glu | Phe |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Asn | Phe | Phe | Lys | Arg | His | Ile | Cys | Asp | Ala | Asn | Lys | Glu | Gly | Met | Phe |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Phe | Arg | Ala | Ala | Arg | Lys | Leu | Arg | Gln | Phe | Leu | Lys | Met | Asn | Ser |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Thr | Gly | Asp | Phe | Asp | Leu | His | Leu | Leu | Lys | Val | Ser | Glu | Gly | Thr | Thr |
| | | 100 | | | | | 105 | | | | | | 110 | | |
| Ile | Leu | Leu | Asn | Cys | Thr | Gly | Gln | Val | Lys | Gly | Arg | Lys | Pro | Ala | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Gly | Glu | Ala | Gln | Pro | Thr | Lys | Ser | Leu | Glu | Glu | Asn | Lys | Ser | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Lys | Glu | Gln | Lys | Lys | Leu | Asn | Asp | Leu | Cys | Phe | Leu | Lys | Arg | Leu | Leu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gln | Glu | Ile | Lys | Thr | Cys | Trp | Asn | Lys | Ile | Leu | Met | Gly | Thr | Lys | Glu |
| | | | 165 | | | | | 170 | | | | | | 175 | |

His

<210> 15
 <211> 144
 <212> PRT
 <213> Homo sapiens

<400> 15

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Leu | Ala | Met | Val | Leu | Thr | Ser | Ala | Leu | Leu | Leu | Cys | Ser | Val |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ala | Gly | Gln | Gly | Cys | Pro | Thr | Leu | Ala | Gly | Ile | Leu | Asp | Ile | Asn | Phe |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Leu | Ile | Asn | Lys | Met | Gln | Glu | Asp | Pro | Ala | Ser | Lys | Cys | His | Cys | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ala | Asn | Val | Thr | Ser | Cys | Leu | Cys | Leu | Gly | Ile | Pro | Ser | Asp | Asn | Cys |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Thr | Arg | Pro | Cys | Phe | Ser | Glu | Arg | Leu | Ser | Gln | Met | Thr | Asn | Thr | Thr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Thr | Arg | Tyr | Pro | Leu | Ile | Phe | Ser | Arg | Val | Lys | Lys | Ser | Val |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Glu | Val | Leu | Lys | Asn | Asn | Lys | Cys | Pro | Tyr | Phe | Ser | Cys | Glu | Gln | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Cys | Asn | Gln | Thr | Thr | Ala | Gly | Asn | Ala | Leu | Thr | Phe | Leu | Lys | Ser | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Glu | Ile | Phe | Gln | Lys | Glu | Lys | Met | Arg | Gly | Met | Arg | Gly | Lys | Ile |
| | 130 | | | | | 135 | | | | | 140 | | | | |

<210> 16
 <211> 178
 <212> PRT
 <213> Homo sapiens

<400> 16

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | His | Ser | Ser | Ala | Leu | Leu | Cys | Cys | Leu | Val | Leu | Leu | Thr | Gly | Val |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Arg | Ala | Ser | Pro | Gly | Gln | Gly | Thr | Gln | Ser | Glu | Asn | Ser | Cys | Thr | His |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Phe | Pro | Gly | Asn | Leu | Pro | Asn | Met | Leu | Arg | Asp | Leu | Arg | Asp | Ala | Phe |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ser | Arg | Val | Lys | Thr | Phe | Phe | Gln | Met | Lys | Asp | Gln | Leu | Asp | Asn | Leu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Leu | Leu | Lys | Glu | Ser | Leu | Leu | Glu | Asp | Phe | Lys | Gly | Tyr | Leu | Gly | Cys |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gln | Ala | Leu | Ser | Glu | Met | Ile | Gln | Phe | Tyr | Leu | Glu | Glu | Val | Met | Pro |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gln | Ala | Glu | Asn | Gln | Asp | Pro | Asp | Ile | Lys | Ala | His | Val | Asn | Ser | Leu |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Glu | Asn | Leu | Lys | Thr | Leu | Arg | Leu | Arg | Leu | Arg | Arg | Cys | His | Arg |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Phe | Leu | Pro | Cys | Glu | Asn | Lys | Ser | Lys | Ala | Val | Glu | Gln | Val | Lys | Asn |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ala | Phe | Asn | Lys | Leu | Gln | Glu | Lys | Gly | Ile | Tyr | Lys | Ala | Met | Ser | Glu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Phe | Asp | Ile | Phe | Ile | Asn | Tyr | Ile | Glu | Ala | Tyr | Met | Thr | Met | Lys | Ile |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Arg | Asn | | | | | | | | | | | | | | |

<210> 17
 <211> 199
 <212> PRT
 <213> Homo sapiens

<400> 17

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asn | Cys | Val | Cys | Arg | Leu | Val | Leu | Val | Val | Leu | Ser | Leu | Trp | Pro |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Asp | Thr | Ala | Val | Ala | Pro | Gly | Pro | Pro | Pro | Gly | Pro | Pro | Arg | Val | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Pro | Asp | Pro | Arg | Ala | Glu | Leu | Asp | Ser | Thr | Val | Leu | Leu | Thr | Arg | Ser |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Leu | Ala | Asp | Thr | Arg | Gln | Leu | Ala | Ala | Gln | Leu | Arg | Asp | Lys | Phe |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Pro | Ala | Asp | Gly | Asp | His | Asn | Leu | Asp | Ser | Leu | Pro | Thr | Leu | Ala | Met |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Ala | Gly | Ala | Leu | Gly | Ala | Leu | Gln | Leu | Pro | Gly | Val | Leu | Thr | Arg |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Arg | Ala | Asp | Leu | Leu | Ser | Tyr | Leu | Arg | His | Val | Gln | Trp | Leu | Arg |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Arg | Ala | Gly | Gly | Ser | Ser | Leu | Lys | Thr | Leu | Glu | Pro | Glu | Leu | Gly | Thr |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Gln | Ala | Arg | Leu | Asp | Arg | Leu | Leu | Arg | Arg | Leu | Gln | Leu | Leu | Met |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ser | Arg | Leu | Ala | Leu | Pro | Gln | Pro | Pro | Pro | Asp | Pro | Pro | Ala | Pro | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Ala | Pro | Pro | Ser | Ser | Ala | Trp | Gly | Gly | Ile | Arg | Ala | Ala | His | Ala |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ile | Leu | Gly | Gly | Leu | His | Leu | Thr | Leu | Asp | Trp | Ala | Val | Arg | Gly | Leu |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Leu | Leu | Leu | Lys | Thr | Arg | Leu | | | | | | | | | |
| | | 195 | | | | | | | | | | | | | |

<210> 18
 <211> 219
 <212> PRT
 <213> Homo sapiens

<400> 18

Met Cys Pro Ala Arg Ser Leu Leu Leu Val Ala Thr Leu Val Leu Leu
1 5 10 15
Asp His Leu Ser Leu Ala Arg Asn Leu Pro Val Ala Thr Pro Asp Pro
20 25 30
Gly Met Phe Pro Cys Leu His His Ser Gln Asn Leu Leu Arg Ala Val
35 40 45
Ser Asn Met Leu Gln Lys Ala Arg Gln Thr Leu Glu Phe Tyr Pro Cys
50 55 60
Thr Ser Glu Glu Ile Asp His Glu Asp Ile Thr Lys Asp Lys Thr Ser
65 70 75 80
Thr Val Glu Ala Cys Leu Pro Leu Glu Leu Thr Lys Asn Glu Ser Cys
85 90 95
Leu Asn Ser Arg Glu Thr Ser Phe Ile Thr Asn Gly Ser Cys Leu Ala
100 105 110
Ser Arg Lys Thr Ser Phe Met Met Ala Leu Cys Leu Ser Ser Ile Tyr
115 120 125
Glu Asp Leu Lys Met Tyr Gln Val Glu Phe Lys Thr Met Asn Ala Lys
130 135 140
Leu Leu Met Asp Pro Lys Arg Gln Ile Phe Leu Asp Gln Asn Met Leu
145 150 155 160
Ala Val Ile Asp Glu Leu Met Gln Ala Leu Asn Phe Asn Ser Glu Thr
165 170 175
Val Pro Gln Lys Ser Ser Leu Glu Glu Pro Asp Phe Tyr Lys Thr Lys
180 185 190
Ile Lys Leu Cys Ile Leu Leu His Ala Phe Arg Ile Arg Ala Val Thr
195 200 205
Ile Asp Arg Val Thr Ser Tyr Leu Asn Ala Ser
210 215

<210> 19

<211> 132

<212> PRT

<213> Homo sapiens

<400> 19

Met Ala Leu Leu Leu Thr Thr Val Ile Ala Leu Thr Cys Leu Gly Gly
1 5 10 15
Phe Ala Ser Pro Gly Pro Val Pro Pro Ser Thr Ala Leu Arg Glu Leu

| 20 | | | | | | | | | | 25 | | | | | 30 | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Ile | Glu | Glu | Leu | Val | Asn | Ile | Thr | Gln | Asn | Gln | Lys | Ala | Pro | Leu | Cys | | | | | | | | | | | | | | | |
| | | 35 | | | | | | 40 | | | | 45 | | | | | | | | | | | | | | | | | | |
| Asn | Gly | Ser | Met | Val | Trp | Ser | Ile | Asn | Leu | Thr | Ala | Gly | Met | Tyr | Cys | | | | | | | | | | | | | | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | | | | | | | | | | | | | | |
| Ala | Ala | Leu | Glu | Ser | Leu | Ile | Asn | Val | Ser | Gly | Cys | Ser | Ala | Ile | Glu | | | | | | | | | | | | | | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | | | | | | | | | | | | | | |
| Lys | Thr | Gln | Arg | Met | Leu | Ser | Gly | Phe | Cys | Pro | His | Lys | Val | Ser | Ala | | | | | | | | | | | | | | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | | | | | | | | | | | | | | |
| Gly | Gln | Phe | Ser | Ser | Leu | His | Val | Arg | Asp | Thr | Lys | Ile | Glu | Val | Ala | | | | | | | | | | | | | | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | | | | | | | | | | | | | | |
| Gln | Phe | Val | Lys | Asp | Leu | Leu | Leu | His | Leu | Lys | Lys | Leu | Phe | Arg | Glu | | | | | | | | | | | | | | | |
| | 115 | | | | | | 120 | | | | | 125 | | | | | | | | | | | | | | | | | | |
| Gly | Arg | Phe | Asn | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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<210> 20
 <211> 114
 <212> PRT
 <213> Homo sapiens

<400> 20

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Asn | Trp | Val | Asn | Val | Ile | Ser | Asp | Leu | Lys | Lys | Ile | Glu | Asp | Leu | Ile | | | | | | | | | | | | | | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | | | | | | | | | | | | | | |
| Gln | Ser | Met | His | Ile | Asp | Ala | Thr | Leu | Tyr | Thr | Glu | Ser | Asp | Val | His | | | | | | | | | | | | | | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | | | | | | | | | | | | | | |
| Pro | Ser | Cys | Lys | Val | Thr | Ala | Met | Lys | Cys | Phe | Leu | Leu | Glu | Leu | Gln | | | | | | | | | | | | | | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | | | | | | | | | | | | | | |
| Val | Ile | Ser | Leu | Glu | Ser | Gly | Asp | Ala | Ser | Ile | His | Asp | Thr | Val | Glu | | | | | | | | | | | | | | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | | | | | | | | | | | | | | |
| Asn | Leu | Ile | Ile | Leu | Ala | Asn | Asn | Ser | Leu | Ser | Ser | Asn | Gly | Asn | Val | | | | | | | | | | | | | | | |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 | | | | | | | | | | | | | | | |
| Thr | Glu | Ser | Gly | Cys | Lys | Glu | Cys | Glu | Glu | Leu | Glu | Glu | Lys | Asn | Ile | | | | | | | | | | | | | | | |
| | | | 85 | | | | | 90 | | | | | 95 | | | | | | | | | | | | | | | | | |
| Lys | Glu | Phe | Leu | Gln | Ser | Phe | Val | His | Ile | Val | Gln | Met | Phe | Ile | Asn | | | | | | | | | | | | | | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | | | | | | | | | | | | | | |
| Thr | Ser | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

<400> 21

17

<210> 22
 <211> 200
 <212> PRT
 <213> Homo sapiens

<400> 22

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Phe | Thr | Glu | His | Ser | Pro | Leu | Thr | Pro | His | Arg | Arg | Asp | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Cys | Ser | Arg | Ser | Ile | Trp | Leu | Ala | Arg | Lys | Ile | Arg | Ser | Asp | Leu | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ala | Leu | Thr | Glu | Ser | Tyr | Val | Lys | His | Gln | Gly | Leu | Asn | Lys | Asn | Ile |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Asn | Leu | Asp | Ser | Ala | Asp | Gly | Met | Pro | Val | Ala | Ser | Thr | Asp | Gln | Trp |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ser | Glu | Leu | Thr | Glu | Ala | Glu | Arg | Leu | Gln | Glu | Asn | Leu | Gln | Ala | Tyr |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| Arg | Thr | Phe | His | Val | Leu | Leu | Ala | Arg | Leu | Leu | Glu | Asp | Gln | Gln | Val |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| His | Phe | Thr | Pro | Thr | Glu | Gly | Asp | Phe | His | Gln | Ala | Ile | His | Thr | Leu |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Leu | Leu | Gln | Val | Ala | Ala | Phe | Ala | Tyr | Gln | Ile | Glu | Glu | Leu | Met | Ile |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Leu | Glu | Tyr | Lys | Ile | Pro | Arg | Asn | Glu | Ala | Asp | Gly | Met | Pro | Ile |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asn | Val | Gly | Asp | Gly | Gly | Leu | Phe | Glu | Lys | Lys | Leu | Trp | Gly | Leu | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Val | Leu | Gln | Glu | Leu | Ser | Gln | Trp | Thr | Val | Arg | Ser | Ile | His | Asp | Leu |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Arg | Phe | Ile | Ser | Ser | His | Gln | Thr | Gly | Ile | Pro | Ala | Arg | Gly | Ser | His |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Tyr | Ile | Ala | Asn | Asn | Lys | Lys | Met | | | | | | | | |
| | | 195 | | | | | 200 | | | | | | | | |

<210> 23
 <211> 181
 <212> PRT
 <213> Homo sapiens

<400> 23

Ser Pro Leu Pro Ile Thr Pro Val Asn Ala Thr Cys Ala Ile Arg His

| 1 | 5 | 10 | 15 |
|---|-----|-----|-----|
| Pro Cys His Asn Asn Leu Met Asn Gln Ile Arg Ser Gln Leu Ala Gln | 20 | 25 | 30 |
| Leu Asn Gly Ser Ala Asn Ala Leu Phe Ile Leu Tyr Tyr Thr Ala Gln | 35 | 40 | 45 |
| Gly Glu Pro Phe Pro Asn Asn Leu Asp Lys Leu Cys Gly Pro Asn Val | 50 | 55 | 60 |
| Thr Asp Phe Pro Pro Phe His Ala Asn Gly Thr Glu Lys Ala Lys Leu | 65 | 70 | 80 |
| Val Glu Leu Tyr Arg Ile Val Val Tyr Leu Gly Thr Ser Leu Gly Asn | 85 | 90 | 95 |
| Ile Thr Arg Asp Gln Lys Ile Leu Asn Pro Ser Ala Leu Ser Leu His | 100 | 105 | 110 |
| Ser Lys Leu Asn Ala Thr Ala Asp Ile Leu Arg Gly Leu Leu Ser Asn | 115 | 120 | 125 |
| Val Leu Cys Arg Leu Cys Ser Lys Tyr His Val Gly His Val Asp Val | 130 | 135 | 140 |
| Thr Tyr Gly Pro Pro Asp Thr Ser Gly Lys Asp Val Phe Gln Lys Lys | 145 | 150 | 155 |
| Lys Leu Gly Cys Gln Leu Leu Gly Lys Tyr Lys Gln Ile Ile Ala Val | 165 | 170 | 175 |
| Leu Ala Gln Ala Phe | 180 | | |

<210> 24
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:PCR Primer

<400> 24
 catatgttcc caaccattcc cttatccag 29

<210> 25
 <211> 33
 <212> DNA
 <213> Artificial Sequence
 <220>

<223> Description of Artificial Sequence:PCR Primer

<400> 25

gggggatcct cactagaagc cacagctgcc etc 33

<210> 26

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 26

ccccggatcc gccaccatgg atctctggca gctgctgtt 39

<210> 27

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 27

ccccgtcgac tctagagcta ttaaatacgt agctcttggg 40

<210> 28

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 28

cgcggatccg attagaatcc acagctcccc tc 32

<210> 29

<211> 66

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 29

ccccctctag acatatgaag aagaacatcg cattcctgct ggcattctatg ttcgttttct 60
ctatcg 66

<210> 30

<211> 65

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 30

gcattctatgt tcgttttctc tatcgctacc aacgcttacg cattcccaac cattccctta 60
tccag 65

<210> 31

<211> 62

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 31

gcagtggcac tggctggttt cgctaccgta gcgcaggcct tcccaaccat tcccttatcc 60
ag 62

<210> 32

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PCR Primer

<400> 32

ccccgtcgac acatatgaag aagacagcta tcgcgattgc agtggcactg gctggtttc 59

<210> 33

<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR Primer

<400> 33

ctgcttgaag atctgcccac accgggggct gccatc

36

<210> 34
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR Primer

<400> 34

gtagcgcagg ccttcccaac catt

24

<210> 35
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR Primer

<400> 35

ctgcttgaag atctgcccag tccgggggca gccatcttc

39

<210> 36
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR Primer

<400> 36

gggcagatct tcaagcagac ctacagcaag ttcgactgca actcacacaa c

51

<210> 37
 <211> 34
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:PCR Primer

 <400> 37
 cgcggtaccc gggatccgat tagaatccac agct 34

 <210> 38
 <211> 36
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:PCR Primer

 <400> 38
 gggcagatct tcaagcagac ctactgcaag ttcgac 36

 <210> 39
 <211> 42
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:PCR Primer

 <400> 39
 cgcggtaccg gatccttagc agaagccaca gctgccctcc ac 42

 <210> 40
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:PCR Primer

 <400> 40
 gtagcgcagg ccttcccaac catt 24

<210> 41
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PCR Primer

<400> 41

ccccgtcgac tctagagcca ttagatacaa agctcttggg

40